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REMARKS ON

Chronic Inflammation of the Knee Joint,

WITH DESCRIPTION OF

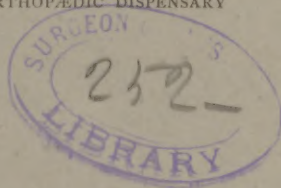
A NEW APPARATUS.

✓

By SIMEON A. FOSTER, M. D.,

OF NEW YORK,

ASSISTANT SURGEON TO THE NEW YORK ORTHOPÆDIC DISPENSARY  
AND HOSPITAL.



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REMARKS ON CHRONIC INFLAMMATION OF  
THE KNEE JOINT, WITH DESCRIPTION  
OF A NEW APPARATUS.

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IN chronic knee-joint inflammation, after the lesion has involved the osseous structure, we meet with a deformity due to the action of the contracted hamstring muscles, which, unless arrested, sooner or later terminates in subluxation of the tibia. The causes operating to produce this posterior displacement of the head of the tibia, are amply explained upon the basis of the continued reflex spasm of the flexors, which gradually draws the head of the tibia backward as in the normal act of flexion. It has been pointed out by my friend and preceptor, Dr. Newton M. Shaffer, on many occasions, and I have seen many illustrations of the fact that we do not find the peculiar reflex spasm of the muscles in chronic joint disease until an osteitis is developed; or, in other words, that chronic synovitis, *per se*, is not accompanied by reflex disturbances, and subluxation or joint-rigidity is not among its characteristics. In my practice among the patients of the Orthopædic Dispensary, I have found many patients suffering from chronic osteitis of the knee, and as the Institution encourages the assistant staff in these studies, and permits a judicious latitude in the way of experiment, I was led to think especially of these

cases, and to attempt to devise an instrument which would meet the indications and which would be easily and readily adjusted. No one who has seen the admirable action of Dr. Shaffer's knee-splint<sup>1</sup> can doubt that it meets in every way the indications in chronic osteitis. It is, however, somewhat expensive, and some experience is needed to properly manipulate it.

The splint I have devised was suggested by this apparatus, and its essential principles are some of its features. I have often noted the great relief afforded by rest in chronic osteitis of the knee-joint. In dispensary practice I have used a simple retention splint with immediate, but as the sequel proved, temporary relief. There would occur, sooner or later, paroxysms of pain, indicating that there was some defect in the system of simple rest and immobilization. In a recent lecture upon this subject, Dr. Shaffer has distinctly pointed out that the ordinary forms of apparatus, and those making a fulcrum of the diseased articular surfaces, produce a greater or less modification of mobility; but they do not remove inter-articular pressure, nor do they antagonize the reflex muscular action. In order to successfully meet all the indications, we must apply a direct pressure to the head of the tibia, not at its lower third as is usually done, and a direct traction should be applied after the head of the tibia has been either supported or slightly moved toward extension.

Dr. Shaffer also rightly insists that in imitating the movement of the tibia, while passing from flexion to extension, we should have an independent movement of the apparatus at the knee-joint. In his apparatus he has introduced this very accurately, and it accomplishes all that is desired. In

<sup>1</sup> On Reflex Muscular Contraction and Atrophy in Joint Disease, with remarks on Mechanical Extension and a description of New Apparatus. By Newton M. Shaffer, M.D., *Archives of Clinical Surgery*, June, 1877.

my own splint I have introduced a bar with a slot and screws, and an antero-posterior hinge, so that in applying extension we can carry the head of the tibia toward extension and then apply traction in the acquired position, as in Dr. Shaffer's splint. The advantage claimed for this splint is that it is cheaper, more easily managed, and that, in the majority of instances, it meets all the indications.

The splint, in detail, is shown in Fig. 1. It consists of three essential parts—the thigh, the leg, and intermediate. The thigh piece A is made of sheet steel padded, and is joined to the leg piece B by the hinged slot G, and the extension rod E is made to terminate *above the center of the leg piece B*, so that as we apply an extension force—it throws

the whole leg piece forward at the expense of an independent movement at the hinged slot. The slotted joint is then fixed by turning the nut with a wrench. We therefore throw the whole tibia forward toward the position of extension, and in the acquired position we apply a direct traction by the traction rod F. All inter-articular pressure is thus removed, and we have an advantageous position without making, as

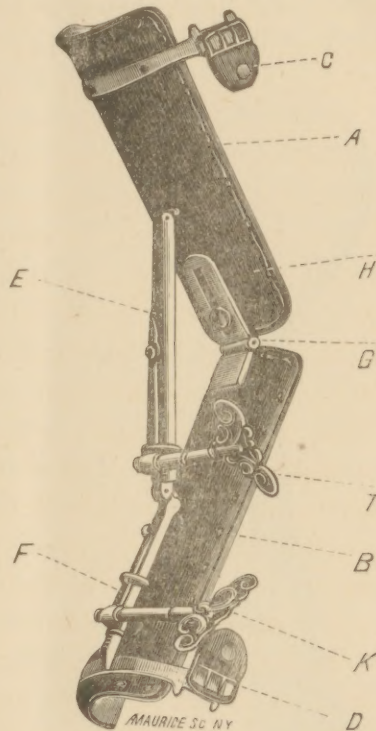


FIG. 1. SPLINT FOR THE TREATMENT OF CHRONIC INFLAMMATION OF THE KNEE JOINT.



do the ordinary forms of apparatus, a fulcrum of the diseased articular surfaces.

To properly adjust this instrument, we first apply adhesive plaster to the leg and thigh, after the Davis method.<sup>1</sup> We apply strips to either side of the leg and thigh, and attach webbing to the ends so that they may be properly

secured to the buckles on the bands at either end of the splint. Over the plaster a bandage is applied. The apparatus is then fixed to the limb by the webbing straps and buckles and a few turns of bandage over the <sup>upper</sup> ~~lower~~ portion of the splint and leg; extension is then made until the head of the tibia is firmly supported, the joint is then made fast. The apparatus is now adjusted, as all apparatus should be, in the exact position of the deformity. The whole splint is now bandaged firmly to the leg, and finally true traction is exerted by the rod at F. The extension bar E can now be used gently, and the flexion reduced to a moderate degree. Never use force enough to give the patient any pain.

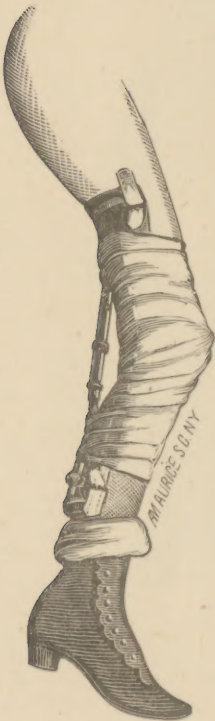


FIG. 2. SPLINT IN PLACE.

Fig. 2 shows the instrument applied. I have used this splint in five cases, and always with marked relief. Its application is simple, its cost is comparatively little, and it needs no special training to adjust it.

In taking the measurements for the instrument maker I use a piece of ordinary pasteboard cut long enough to cover



two-thirds of the posterior portion of the thigh, starting from the knee. The same pattern is taken of the leg. The pieces are then cut the proper width, which should not be so wide as to enclose the thigh or leg to any extent, but only sufficient to make a shallow trough in which the limb will rest comfortably; next I take the circumference of the thigh at its upper two-thirds, taking half of this measurement as the size of the band to which the buckles are attached. The same measure is taken for the band on the leg piece. The angle of flexion is then taken. This is not absolutely necessary, as the extension bar can be made short enough to allow the splint to be flexed to a right angle without interfering with its efficiency. The instrument may be used for either the right or left limb.

This instrument may be ordered from Mr. A. Müller, No. 106 West Thirty-seventh street, New York, who has made several for me.







# ANNALS OF ANATOMY AND SURGERY.

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